respect to an inventive interactive aircraft cabin window display system, an aircraft comprising such system, a method for interactive visualization of information in an aircraft, and a computer program product or a computer readable medium. One skilled in the art will understand that the features may be suitably combined or replaced or transferred to other embodiments in an analogue manner thereby creating further embodiments.

BRIEF DESCRIPTION OF THE DRAWINGS

[0033] The various embodiments will hereinafter be described in conjunction with the following drawing figures, wherein like numerals denote like elements, and:

[0034] .

[0035] FIG. **1** shows an example of an interactive aircraft cabin window display system.

[0036] FIG. **2** shows an example of an aircraft comprising an interactive aircraft cabin window display system.

[0037] FIG. **3** shows an example of a display assembly and an output assembly of an interactive aircraft cabin window display system.

DETAILED DESCRIPTION

[0038] The following detailed description is merely exemplary in nature and is not intended to limit the present disclosure or the application and uses of the present disclosure. Furthermore, there is no intention to be bound by any theory presented in the preceding background or the following detailed description.

[0039] FIG. **1** shows a portion of a cabin **102** in an interior of an aircraft **100**. FIG. **2** shows a top view onto the aircraft **100**.

[0040] In the cabin **102**, several rows of seats **104** are arranged one behind the other. Each seat **104** is arranged next to an aircraft cabin window **106** provided in a fuselage **108** of the aircraft **100**.

[0041] In the aircraft cabin **102** an interactive aircraft cabin window display system **1** according to an embodiment of the present disclosure is provided. The display system **1** comprises a plurality of display assemblies **3**. Each display assembly **3** is arranged in one of the cabin windows **106**. Each display assembly **3** is connected to and controlled by an information visualization assembly **5**. Each information visualization assembly **5** is connected to a passenger monitoring assembly **7** positioned in the interior of the cabin **102** and to one of two environment monitoring assemblies **110** arranged at an outside of the fuselage **108** of the aircraft **100**.

[0042] The display assemblies **3** comprise a screen **9** integrated into the aircraft cabin window **106**. The screen **9** typically comprises a multiplicity of pixels arranged in a two-dimensional matrix, wherein each of the pixels may be controlled to provide a certain degree of transparency and/or colour. By suitably controlling the multiplicity of pixels, variable images may be displayed by the display assembly **3**. Accordingly, the display assembly **3** integrated into the cabin windows **106** will enable a visualization of digital pictures in the cabin windows **106**. For areas of the display assembly not showing any portion of a picture, the cabin window **106** including the display assembly **3** may be transparent as is normally the case. Accordingly, the screen **9** of the display assembly **3** may be provided as a semi-transparent screen such that displayed pictures may have adjustable levels of transparency and brightness. For example, head-up display projection technology, new semi-transparent LCD display technology, or other technologies may be used for implementing the display assembly **3**.

[0043] Each of the display assemblies **3** may be controlled by an associated information visualization assembly **5** to display various types of information or entertainment. For example, each information visualization assembly **5** may be connected to two different data streams of a cabin distribution network **112** of an in-flight entertainment system or any other available data bus. The two data streams may reflect a left-hand and right-hand row of cabin windows **106** on the aircraft cabin **102**, respectively. A connected IFE server may generate at least two separate data streams, i.e., one for each side of the aircraft. Images generated in the servers may make use of aircraft information generated for example by aircraft avionic systems and from information available from ground-based servers. More streams may be generated depending on a number of different views to be simultaneously displayed.

[0044] In order to provide intuitive interactivity for the display system **1**, each portion of the display system **1** adjacent to one of the seats **104** and one of the cabin windows **106** is provided with a passenger monitoring assembly **7**. The passenger monitoring assembly **7** is adapted for detecting a direction in which a passenger sitting, for example, on the window seat **104**, is looking through the aircraft cabin window **106** or pointing through the aircraft cabin window **106**.

[0045] In the embodiment shown in FIG. **1**, the passenger monitoring assembly **7** is provided as an eye-tracking system adapted for tracking a direction in which eyes of a passenger are directed. For such purpose, a small camera **11** is provided within the aircraft cabin **102** at a location close to an upper part of the window seat **104** such that its optics are directed to a region that typically coincides with a head of a passenger sitting on the window seat **104**. Using such camera **11** together with a suitable control algorithm, the passenger monitoring assembly **7** may detect the eyes of the passenger and their orientation, and from such information the passenger monitoring assembly **7** may derive a direction into which the passenger is currently looking. Such information from the eye-tracking passenger monitoring assembly **7** may then be transmitted to the information visualization assembly **5**.

[0046] Furthermore, in one embodiment, the information visualization assembly **5** is connected to an environment monitoring assembly **110**. The environment monitoring assembly **110** may comprise two cameras **112**, **114** arranged at an outer skin of the fuselage **108** of the aircraft **100**. Each camera **112**, **114** may acquire an image representing an environment at one of both sides of the aircraft **100**. Such image information may then be transmitted to each of the information visualization assemblies **5**.

[0047] Based on the information of both the passenger monitoring assembly **7** and the environment monitoring assembly **110**, the information visualization assembly **5** may control the display assembly **3** to, for example, visualize suitable information on the screen **9** at specific locations. Therein, the information visualization assembly **5** may, for example, analyse a direction in which the passenger is currently looking through the window **106** and may then determine, using the representation information acquired from the environment monitoring assembly **112**, at which object outside the aircraft **100** the passenger is probably currently looking. Having identified such object, the information visualization assembly **5** may acquire further information about this object, for example, from the IFE server. Finally, such addi-